What is claimed is:

1. A motor using a rectangular wave wire, in an apparatus of electrically opening and closing a sliding door, comprising:

a linear magnetic pole row (2) in which N poles and S poles are alternately arranged at a fixed pitch (p), the linear magnetic pole row being placed in an upper end portion of the sliding door;

two sets of rectangular wave wires (3A, 3B) in which elements in a direction of an axis Y are arranged in a direction of an axis X at the fixed pitch (p), the rectangular wave wires being fixed to a building so as to face to said linear magnetic pole row (2); and

a means for sending an electric current through said two sets of rectangular wave wires (3A, 3B),

three axes X, Y and Z being orthogonal to each other, the axis X being set in a direction of an opening and closing movement of said sliding door, and the axis Z being approximately vertical,

wherein said two sets of rectangular wave wires (3A, 3B) are shifted by a half pitch (p/2) from each other in the direction of the axis X, and said means for sending an electric current has a function of alternately switching the electric current application

of any one set of rectangular wave wire to the other set of rectangular wave wire, every time when the linear magnetic pole row (2) fixed to said sliding door moves by one half pitch (p/2).

2. A motor using a rectangular wave wire as claimed in claim 1, wherein said means for sending an electric current is provided with a measure (7) which is arranged in the direction of the axis X and attached to the sliding door, and an optical sensor (8) which reads a moving distance of said measure and is attached to the building, and said optical sensor has a function of outputting a detected signal every time when said measure moves by one half pitch (p/2).

3. A motor using a rectangular wave wire as claimed in claim 1 or 2, wherein a rail-cum-case (10) having an angular C-shaped cross section, and having a shape schematically similar to a curtain rail is provided to the motor, said rectangular wave wire (3) is attached to an inner surface of said rail-cum-case, and said linear magnetic pole row (2) can pass through a space within said rail-cum-case in the direction of the axis X.

4. A motor using a rectangular wave wire, comprising:

a rotary shaft (6a) rotatably supported coaxially with an axis Z;

an annular magnetic pole row (4) supported in parallel to a plane H by said rotary shaft (6a); and

a rectangular wave coil (5) corresponding to a stationary member, said rectangular wave coil being arranged so as to face to said annular magnetic pole row with a distance and in parallel,

the axis Z being an axis in a direction of Z-coordinate and the plane H being orthogonal to the axis Z,

wherein said annular magnetic pole row is structured such that N poles and S poles are alternately arranged at a fixed angular pitch p, and said rectangular wave coil is structured such that radial elements around the axis Z are arranged at the pitch p.

5. A motor using a rectangular wave wire as claimed in claim 4, wherein said rectangular wave coil is structured such that a first phase rectangular wave coil (5A) and a second phase rectangular wave coil (5B) are arranged so as to be shifted by one fourth angular pitch (p/4), is provided with a Hall sensor (18) detecting an angle of rotation of said annular magnetic pole row (4) per one fourth angular pitch (p/4), and is provided with a switch circuit alternately switching an electric current application of the first phase rectangular wave coil (5A) and an electric current

application of the second phase rectangular wave coil (5B) on the basis of a detected signal of said Hall sensor.